THE OPTICAL

MAGIC LANTERN

JOURNAL

AND

PHOTOGRAPHIC ENLARGER.

EDITED BY J. HAY TAYLOR.

Vol. 7.—No. 87. [Entered at Stationers' Hall] AUGUST, 1896. Price 1d., Post-free 2d.

CONTENTS.

PAGE
Our Forthcoming Annual .. 121
Notes.. .. 122
A Shop Window Attraction.. .. 122
Stereoscopic Effects on the Lantern Screen .. 123
Science Lessons at Board Schools .. 125
Hints for Science Teachers 125
Packing Lantern Slides for the Post.. .. 126
Effects.. .. 127
How I kept a Lantern Appointment although missing the train .. 128
Carriers and Slide Boxes .. 129
Lighting Tableaux Vivants and Stage Effects .. 130
Kinetoscope and Lantern .. 132
The Invention and Development of the Optical Lantern .. 134
New Apparatus .. 135
Correspondence .. 135
Patent Intelligence.. .. 136
Notes and Queries 136

Notices.

The *Optical Magic Lantern Journal and Photographic Enlarger* is issued on the 1st of every month, price One Penny, and may be obtained from all Newsvendors, Railway News Stalls, Photographic Dealers, or from the Publishers, at the following rates, post free:—

		United States.
12 months	2/6	75 cents.
Single copies	2½d.	8 „

Advertisements (Scale of Charges), displayed:—

	£	s.	d.
Front and back pages, by arrangement.			
Ordinary page (whole)	3	0	0
„ „ (half)	1	15	0
„ „ (quarter)	1	0	0
„ „ (eighth)	0	10	0
„ „ per 1 inch in column	0	6	0
„ „ „ ½ „ „	0	3	0

Exchange Column, General Wants, &c. (not Trade)—First 20 words, 6d.; and for every 3 additional words, 1d.

Small Advertisements must reach the office not later than the first post on the 24th of each month. All cheques and postal orders to be made payable to the Magic Lantern Journal Company, Limited.

Editorial communications must be addressed, J. HAY TAYLOR. Advertisements and business communications to the **Magic Lantern Journal Company, Limited, 9, Carthusian Street, London, E.C.**

American Agents:—The International News Co., 83 and 85, Duane Street, New York City.

Important Notice!!!

We have much pleasure in informing our numerous readers that we have removed to our new offices at

9, CARTHUSIAN STREET, E.C.

(Close to Aldersgate Street Station).

All **EDITORIAL** communications should be addressed—

J. HAY TAYLOR,
"Optical Magic Lantern Journal,"
9, CARTHUSIAN STREET,
LONDON, E.C

All **BUSINESS** communications, advertisements, etc., should be addressed—

The Secretary,
Magic Lantern Journal Co., Ltd.,
9, CARTHUSIAN STREET,
LONDON, E.C.

Our Forthcoming Annual.

Our Almanac and Annual is now well advanced, and will be published towards the end of this month. We have no hesitation in saying that it will be an interesting and attractive volume. It will contain three sections, viz., Original Articles, Notes on Novelties, and a copious list of exporters of scientific apparatus in London, Liverpool, Manchester, Birmingham and Glasgow, also importers of scientific goods in the principal colonies.

Notes.

On Friday, June 12th, Mr. Jex. Bardwell, of Detroit, U.S.A., celebrated his fiftieth wedding day. In the United States, all photographic and lantern folks know Mr. Bardwell; he stands at the top of the tree in many subjects, and as a lantern operator he is envied by all who have tried their hands at operating. In our Annual will appear an interesting article from Mr. Bardwell, on American lantern work.

* * *

On another page will be found an interesting communication on "Kinetoscope and Lantern," by Mr. A. Lomax. Mr. Lomax has had a great deal to do with kinetoscopes for some years past, and is an authority on this subject. Some time ago he was appointed sole agent for Great Britain for the Kansas Phonograph Company, and his premises at 28, Caunce Street, Blackpool, are well known in connection with same.

* * *

The partnership heretofore subsisting between Frederick York and William York, carrying on business as optical slide manufacturers and photographic publishers, at 87, Lancaster Road, Notting Hill, in the county of London, under the style or firm of York & Son, has been dissolved by mutual consent. All debts due to and owing by the said late firm will be received and paid by the said Frederick York.

* * *

The *Australian Photographic Journal* has removed from its address, 332, Kent Street, Sydney, to larger premises at 66, King Street, Sydney.

* * *

Some recent experiments conducted in Germany demonstrated that a light of 1 candle-power could be seen on a clear dark night at a distance of one mile; a 3 candle-light, three miles.

* * *

In the United States, insurance companies will not entertain buildings in which acetylene gas is used. It is claimed that time will overcome the opposition of the insurance companies.

* * *

Working at full time, 1,675 pounds of calcium carbide are produced every twenty-four hours at the Froges manufactory, in France. The motive power (1,000 horse-power) is obtained from a waterfall. The works are provided with two dynamos each of 6,000 ampères at 60 volts.

* * *

Messrs. Thorn & Co., of 169, Camberwell New Road, will in future conduct their business under the title of Thorn & Hoddle.

At a garden party, held on Saturday the 11th July, in the grounds of the "Union Tavern," Vassal Road, Camberwell, S.E., the lawn was brilliantly illuminated by acetylene gas, the generators and fittings being supplied and fixed by Messrs. Thorn & Hoddle, inventors and manufacturers of the "Incanto" Acetylene Gas Generator, of 169, Camberwell New Road, S.E. This, we believe, is the first occasion on which this splendid light has been applied in such a practical manner. The light was exceedingly brilliant, and illuminated the spacious lawn (on which dancing was being enjoyed by about 500 persons) in an excellent manner.

* * *

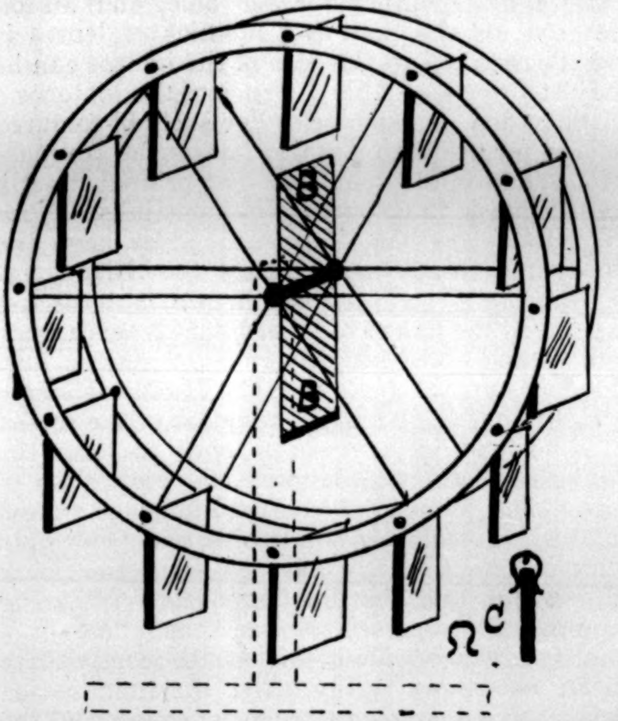
The most brilliant light in the world is said to be at the lighthouse at Cape de Hève, near Havre. It is of 23,000,000 candle-power.

—:o:—

A Shop Window Attraction.

SO keen is the competition in business nowadays, that it is by many found necessary to avail themselves of all the window attractions possible in order to keep their places of business going. In the lantern and photographic trade, this, in many instances applies; but on the other hand there are firms whose goods are looked upon as standard goods, and who, by reason of their being long established, possess a business which yet keeps growing, simply because all goods sent out are of the highest possible quality, and these act as it were as a perpetual advertisement; and by reason of the excellence of the goods in question a good price is constantly obtained, notwithstanding the occasional cutting of prices by other firms in the same line. To such firms as these, window decorations, though perhaps necessary to an extent, are not of the same importance as they are to firms that have only been for a short time established, and who have to resort to all kinds of attractions in order to get people to inspect their shop windows. However, no one likes to refuse business, and those that have a good connection still want to increase it, whilst others who have little business coming in, stand sadly in need of it.

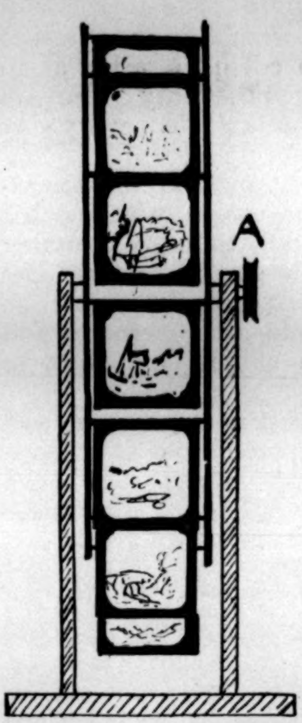
When looking at the windows of those who deal in lantern slides one cannot help noticing that in very many instances the slides are not displayed to that advantage which they might be. We have seen slides lying flat on white paper in shop windows, and also ranged in a row close to the window-pane with dark objects behind, or else in front of a strip of mirror placed at anything but the correct angle for passers-by to see. Again, we have seen the same dozen or more slides doing duty in a window for several months at a time, it evidently being thought quite unnecessary that a change would be of any advantage.



Those who would wish to have a little extra shop window attraction by way of displaying slides for the season now at hand might do worse than resort to something of the following style. The appliance can hold any number of slides according to the diameter of the wheel portion, but in the diagram herewith, it is for holding a dozen. The slides can be changed readily, hence, little time would be expended in making a complete change at least once a day.

The relative portions of the sketch being to scale, particulars as to the making of the revolving wheel need not be entered into, as any mechanic could grasp the whole idea at a glance. The edge of the wheel should, of course, be placed facing the window, and a band on the pulley wheel (A) attached to a clock-work or electric motor would supply all the driving power necessary.

In order to get good illumination on the slides it will be necessary to have a piece of white cardboard or opal glass (B) hung on the axle, the lower side being the heavier, so that although the wheel revolves it will remain stationary.



Various devices may be resorted to for hanging the slides on the cross rods, but perhaps the method shown at (C) will prove as simple as any, and consists of small springs which grip the slide at both sides.

By the judicious arrangement of shielded lights placed at side of reflector, a pretty effect is produced as each slide is gradually brought to view.

Stereoscopic Effects on the Lantern Screen.

WHAT HAS BEEN DONE AND WHAT MAY BE DONE.—No. IV.

By Thomas Bolas, F.C.S., F.I.C.

(Continued from page 118.)

A FURTHER development of the principle of the anaglyph, whereby stereoscopic effects in colour may be obtained, and a method applicable to lantern projection, has been recently described by M. Ducos du Hauron (*Revue Suisse de Photographie*, Nov. 1895, p. 394), and a shorter account is to be found on p. 111 of *The Amateur Photographer* for February 7th, 1896. The principle of the method consists in making two of the coloured elements of the three-colour set correspond to one of the pictures of the stereoscopic pair, and making the third element of the three-colour set to correspond to the other picture of the stereoscopic pair. The sense of relief in this case is produced by the difference in drawing between one element of the three-colour set and the other two elements. In either of the above-mentioned places will be found a statement as to the three possible ways of carrying out this idea, which in its present state is perhaps to be looked upon rather as an interesting, theoretical possibility than a matured method now available for every day practice.

Having indicated every method of stereoscopic projection upon the screen with which I am familiar, I propose now to make a number of discursive suggestions for improving and developing projection stereoscopy, or for so bringing it before the public, that a general and growing interest in the subject may lead to improvements.

In order to create interest in the matter, and to direct attention to the possibilities of stereoscopic projection, I would suggest that some enterprising manufacturer of lantern appliances might easily put up for sale in a cardboard box, at the price of say 2s. 6d., a pair of coloured glasses, and half-a-dozen pairs of bi-coloured spectacles, along with such instructions as would enable anyone having two lanterns (whether a pair or not), or a bi-unial, and some one or more stereoscopic transparencies, to introduce lantern stereoscopy as a feature of his entertainments; but of course half a-dozen pairs of spectacles would not serve for a large assembly; still as coloured spectacles can now be had in the toy shops for a half-penny a pair, and those required for our present use need not cost more, extra spectacles could be easily provided as required. The question as to the colours of the glasses would have to be considered, and of all available combinations, I believe the copper ruby and signal green, adopted by Mr. Freshwater, to be one of the worst for general purposes.

A rough test of the suitability of any two-coloured glasses is their high transparency when not superimposed, and their high opacity when superimposed; and any person who has a large assortment of samples of coloured glass available for trial may easily satisfy himself that a gold pink and yellowish green will best satisfy these conditions. Owing, however, to the fact that gold pink glass is hardly a current commercial article, and when obtainable it is expensive and generally has that irregular surface which makers of church windows prefer, I recommend the next most efficient combination; cobalt blue glass—not too dark, and a rather deep yellow inclining to orange. The colours must, however, be selected in reference to the criteria I have given— maximum of light when side by side, and maximum of darkness when superimposed. This is the combination originally employed by Blanchère in 1853, and not only are such glasses to be had in commerce at a low rate and uniform in substance, but a first-class oil lamp is very nearly as efficient with the yellow glass as is an indifferent lime-light; hence excellent results can be obtained with a lime lantern for the blue, and an oil lantern for the yellow. Identity of lenses is not necessary, as the size of the images can be adjusted by a suitable distance of the lanterns.

Should a demand arise for such bi-coloured slides, for use with a single lantern, as are mentioned above, they could be best printed directly on the glass, in coloured gelatinous inks, by the Woodbury method, but such slides have the following disadvantage over the Blanchere-D'Almeida system, in which two lanterns are used, and the halves of an ordinary transparency are backed up by suitably coloured glasses. In the former case (*i.e.*, the Du Hauron-Demole single slide) the white illumination of the screen is a real white, and corresponds to what the lantern will transmit through the clear glass of the slide. When the confused image is viewed through the coloured spectacles, each eye only sees certain selected coloured elements out of this white, and these coloured elements being approximately complimentary, the effect of a fictitious white is produced. Consequently there is an enormous falling off of the illumination when the coloured spectacles are used, and the impression of bad illumination is given. In the two-lantern method the whites of the screen image are formed not of real white, but of the fictitious white resulting from the union of the complimentary tints, and on using the coloured spectacles, there is not the same kind of falling off in illumination as in the other case. I have, however, found it practicable to illuminate by fictitious white in the case of the one-lantern method, and so avoid that sudden fall of the illumination which is fatal to the succees of an exhibition.

A screen is made of equal strips or squares of colours corresponding to those of the images forming the slides, and this is placed either close to the illuminant or in the place of the lens diaphragm as may be convenient, the advantage of using strips or small squares being that the screen may be placed at some distance from one of the theoretical positions; indeed, quite in front of the objective in many cases.

When stereoscopic subjects are to be shown in the course of a general exhibition the audience should be prepared for the weaker illumination by a short interval of comparative darkness, during which time a few words may be said as to the nature of stereoscopic vision, also as to the difference between such modelling as can be painted on a flat surface and true stereoscopic relief. In addition, instructions may be given as to the use of the spectacles. A few geometrical subjects form a good introduction, but these should be feebly illuminated, so as not to kill the effect of the photographic subjects to follow; and photographs should be selected in which prominent objects in the foreground emphasise the effect of relief.

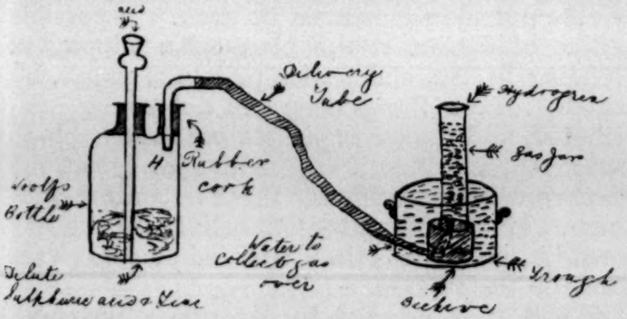
The physical effect of stereoscopic projection upon the screen, is very much discounted if the spectator has to hold a heavy or cumbrous instrument in his hands, as the impression is then as if a stereoscope were being used; hence I think both Mr. Anderton and Mr. Freshwater made a mistake in constructing their observing devices for holding in the hand' instead of for resting on the nose.

——:o:——

Science Lessons at Board Schools.

PRACTICAL science lessons, as given at our Board schools, confer a great benefit on the future lanternists. Below will be found a short paper, written by a 7th Standard boy, 12½ years of age, at the Rendlesham Road school (Clapton) on July 6th, 1896.

It being perfect in its simplicity, we publish it unabridged, with facsimile drawings reduced to about half-size. The subject being the chief factors of the lime light, should be interesting to our younger readers.

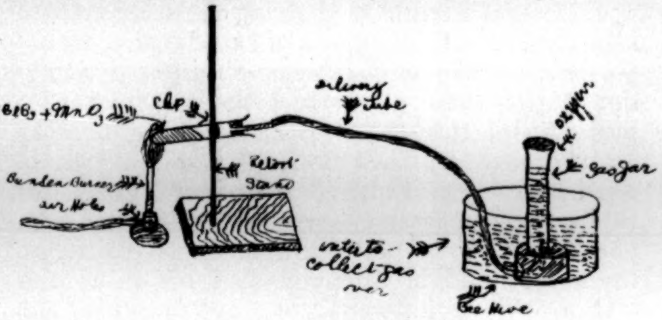


APPARATUS FOR THE PREPARATION OF HYDROGEN FROM ZINC AND SULP. ACID.

Hydrogen—H. H is found in water. Is a gas. Made by adding any metal to any acid. *i.e.*, Zinc + Sulphuric Acid (dilute).

Is invisible. Is inflammable; burns with blue flame. Lightest substance known.

Oxygen—O. Is a gas. Found in air and water. Most abundant element on earth. Prepared by heating Potassium Chlorate, and Manganese Dioxide K.C.L.O._3, and M.N.O._3.



APPARATUS FOR THE PREPARATION OF (OXYGEN) O FROM $\text{K.C.L.O.}_3 + \text{M.N.O.}_3$.

Properties: Heavier than air. Colourless and tasteless. Supports combustion. Sulphur burns in it, forming Sulphur Dioxide (s.o._2). Carbon burns in it, forming Carbon Dioxide (c.o._2).

——:o:——

Hints for Science Teachers.

By E. D. B.

A VERY serviceable glass object tank for the lantern stage can be made by cementing a piece of lead about a quarter of an inch thick and bending it to a U shape.

In microphotography a tank filled with a solution of sulphate of copper and ammonia is used so as to correct chemical focus and absorb heat rays, thus preventing the destruction of the slide.

The elongation of an iron rod when strongly magnetised, may be demonstrated by placing a small helix around the iron rod of the common pyrometer made for showing the longitudinal expansion of a rod by heat. To the end of the index finger that sweeps over the quadrant, affix a small bit of silvered glass mirror not more than a quarter of an inch square. Adjust a pencil of light from the paralleliser of the lantern to this small mirror, so that the reflection from the mirror will fall upon some distant part of the room; the greater the distance from the mirror the better. When a current of electricity is sent through the helix the rod will be slightly elongated; but the slight tilting of the mirror may become a displacement of two or three inches at a distance of thirty feet.

A small piece of apparatus called an opeidoscope is capable of giving amusement and instruction. It consists of a short piece of paper tube such as a gelatino-chloride printing-out paper tube. Over one end is stretched a piece of thin rubber. It is held tight by binding with several turns of twine. A small mirror is fixed to the tightly stretched piece of rubber. A parallel beam of light from the paralleliser of the lantern is arranged to strike the mirror and is thus reflected off on to the screen. When different notes are sung into the tube the stretched membrane is vibrated and various figures are traced upon the screen by the reflected beam of light. The configuration of the figure varies with the note sung into the tube.

Curious figures can be formed by floating a number of short magnets upon water. The figures into which the magnets arrange themselves vary with the number used. By using the vertical attachment they can be projected upon the screen.

——:o:——

Packing Lantern Slides for the Post.

By T. Perkins.

HOW lantern slides may best be packed for transmission by parcel-post or rail, is a matter of some importance, and is one that has been brought forceably to my notice of late by the smashing during transit by post of eighteen slides out of a set of sixty, though they were packed in a box specially constructed by one of the well-known manufacturers of photographic and lantern apparatus for a lantern slide exchange club, whose members, living in various parts of the United Kingdom, contribute at stated intervals slides of specified subjects, which are then packed in a box and circulated by post or rail among the members.

The slides had made one or more journeys in safety, and were carefully repacked and taken to the post office, labelled with a "Fragile" label and sent off; when they arrived at their destination, though no outward signs of rough usage were visible, yet when the box was unlocked it was found that about thirty per cent. were more or less damaged, some were utterly smashed, some had both glasses broken, while some few had escaped with cracked cover-glasses. Complaint was made by the sender to the post-office, and a claim made for compensation, but this has been refused, partly on the ground that the damaged contents were not shown by the recipient to the officials of the delivering office, before he removed the bits of broken glass from the box and unpacked it to see the extent of the damage, partly because there were no signs of damage on the outside of the box, and the postman who delivered it had not noticed anything in its appearance to indicate that any mischief had been done. The Secretary of the post-office therefore said that there was no proof that the injury had been done while the parcel was in its custody. One of the officials, however, volunteered the statement, that though parcels were carefully packed in the hampers provided for the purpose, yet the hampers were often much knocked about at the stations, and I have myself seen them allowed to fall from the top of the omnibuses on which they are carried between a country post town and the railway station. Probably, something of this kind happened to the hamper in which this unfortunate box of slides had been packed. The jar due to the fall must have been communicated to the glass within, with the disastrous effects above described. The object therefore, of anyone sending slides by post should be so to pack them, that any blow received by the box should not be communicated to its contents. The slides must be held firmly, so that they cannot shift, but yet not rigidly; there must be something to act as a buffer between the interior of the box and the edges of the glass; moreover the pressure on the outside slides must be even. A possible source of danger is the plan often adopted of wedging in the slides with pellets of paper, by which means the pressure is not evenly distributed, and the outer glasses are thus liable to be broken, and then if any further jar occurs the damage will be extended to those in contact with them. It was found that the slides, in the box already mentioned that suffered most, were those on the outside.

I will now proceed to describe a box, and method of packing, that will ensure safety from all ordinary accidents that are likely to occur. It may be taken for granted that about eighty is the largest number of ordinary slides that may be sent by post. If the glass is extra thin of course a larger number will still be under the maximum weight allowed. For holding these, a box whose interior dimensions are 3¾ by 3¾ by 10 inches will be needed; the sides and one end should be lined with sheet felt fully ¼ inch thick, glued here and there to the wood, so as to keep it in place. I do not recommend it being glued all over, as when the felt has become hard from wear it must be removed, and fresh felt put in its place, and if it is glued all over it will be difficult to remove. The bottom must also be covered with a piece of the same felt; this need not be fastened, and when the slides have been put in, another piece of felt should be laid on them before the lid is put on. It will be noticed that I have recommended the felt to be put at one end, not both ends of the box, as it will generally happen that the box will not be quite full, and to keep the slides from shifting from end to end, a square of wood 3¼ by 3¼ covered with felt, on one side should be pressed up against the last slide, between this and the end of the box paper crumpled up should be tightly wedged; it will now be impossible for the slides to move. However, as an additional precaution, I should recommend, wherever practicable, that each half dozen slides should be made up into a separate packet by being wrapped in thin paper before being put into the box, or, what will answer equally well, that 3¼ by 3¼ sheets of millboard or thin wood, covered on either side with corrugated paper or soft cloth, should be placed at intervals between the slides, so as to divide them into sets of ten or twelve, as, if any injury is done, it will not spread so far as if the slides formed a solid column of glass. It is hardly necessary to say that the slides are to be put in with their faces parallel to the ends of the box. Instead of felt for the lining of the box, india-rubber tubing may be used if it is preferred. As it is a great object to keep down the weight, the wood of which the box is made should be no thicker than is absolutely necessary for safety. Wood such as that of which cigar boxes are made, if a ¼-inch thick, will probably be sufficient, provided the joints are well made.

For the transmission of a few slides I generally use the boxes in which lantern plates are sold. I put the slides together, wrap them up in paper, place two sheets of corrugated paper 3¼-inches square at the bottom of the box, so that the corrugations cross each other at right angles, and two similar sheets arranged in the same manner in the top, put the slides in the box, put on the cover, tie the box up and wrap a piece of corrugated paper round the outside, covering the top, bottom, and two sides, and then another piece covering the top, bottom and the two sides which are still uncovered. I write the address on a luggage label, fastened to the box with a string long enough to allow of the label being stamped without the stamp touching the box; put a "Fragile" label on, and send the packet by parcel post. I say parcel post, for slides must not be sent by letter post, however securely packed, as I discovered a short time ago when a single slide sent in a box by letter post found its way to the "dead letter office," owing to the person to whom the box was sent having changed his address. On the box being opened the nature of its contents were seen, and I had to send threepence to pay the parcel post rate to get the slide returned to me or sent to the new address of the person for whom it was intended.

——:o:——

Effects.

By F. J. Scrimgeour.

LIMELIGHT is no longer a novelty, and the fact that a lecture is to be "illustrated by views shown by the lime light" has ceased to draw.

The "go-to-meeting" public have been satiated with such photographic views as are commonly used to illustrate lantern lectures, especially those on foreign travel. They have seen those pictures, not only on the screen, but also in the pages of our numerous illustrated magazines until they are tired of them. The uncoloured photographic views I am referring to will still be of interest to that section of the people who in their spare evenings seek for information and education on all subjects; but that large section who after their day's work wish something in the way of entertainment, are beginning to consider the ordinary "magic" lantern show rather a "bore." In fact the single lantern has ceased to be a "magic" lantern in any sense of the word, and the audience of to-day wish something more startling and wonderful than uncoloured slides (however beautiful) being passed along in panoramic style.

Of course, for educational purposes the single will still be of the greatest value. For entertainments, however, the bi-unial and triple are coming again to the front, and many amateurs have obtained if not a complete bi-unial, at least another lantern to supplement their original single.

Many of these gentlemen seem to consider effects so difficult and troublesome to manage, that they leave that department to the professional, and content themselves with using their double lantern for dissolving only.

They are the victims of a false idea. Some of the most pleasing, and to the uninitiated, most wonderful effects are very easily produced; and a few of the most simple may change a somewhat dreary travel lecture into a pleasing educative entertainment.

An example:—At the beginning of a lecture on Continental scenery, at which I have often to operate, the first view is a picture of the packet crossing the channel from Dover to Calais. This is followed by a simple ocean sunset (coloured of course), and while this is on the screen the lecturer describes the beauties of a sunset at sea, as witnessed from the deck of a steamer. While he is thus engaged, I slowly turn up the light in the second lantern, in which has been placed a duplicate slide coloured as moonlight, and coincident on the screen with the first.

As the light in the second lantern increases in brilliancy, the sunset changes from its lovely crimson to a bluish purple, and as the first lantern is then slowly turned down the blue is intensified until there remains on the screen only a night scene with the radiance of the moon glancing on the tops of the waves.

The pair of slides just described cost, I think, only five shillings, but they have brought down more applause than some of our most elaborate triple lantern effects.

In the same way buildings may be lit up as the moon appears. Pairs of slides for such may be had in great variety, and even well-painted ones may be had at comparatively cheap prices.

I use a capital pair for "Westminster Abbey," which were supplied for seven and sixpence. The second slide is all blacked out except the stained glass windows, which are well-tinted.

With both lanterns full on, the illumination is unnoticed by the audience, but as the first view is slowly turned down, the windows appear to get gradually brighter, until only the outline of the massive building can be seen; then comes the applause.

The two examples given require only a bi-unial, but of course much more startling effects may be produced with a triple lantern.

I will not take up more space by describing any of these, as they are mostly only an extension of the above, but close by advising you if you wish to gain an appreciative audience in the coming winter to brighten up your lecture (especially if it is on travel) with a few effects, however simple they may be.

How I Kept a Lantern Appointment although Missing the Train.

By Ad-Amicos.

Sunday, July 20th, 1880.—Illustrated Lecture at Lord Vincent's, Eastbourne, Sussex. "Twenty Minutes in a Jungle."

THERE are dates innumerable in everybody's diary without incidents worth remembering; whilst on the other hand, circumstances at times are so modelled that sufficient accidentals occur within a few hours, as to form the nucleus of many a three volume novel. How the above date got squeezed into my engagements was funny. How the engagement was ever fulfilled was funnier, and how the writer should be induced after so many years to write up a chapter of accidents is of all three the funniest.

Lord Vincent had been touring India, and while there had made some forty or fifty photographs of various scenes and life to be found in the jungle, and wishing them thrown on the screen to entertain the guests specially invited to a dinner party to welcome his safe return, on the date above mentioned, applied to my London agent to furnish him with a reliable party who would carry out his project.

"Would I go?" "Yes." Could just manage to fit it in; as I should finish in good time at Stevenage on the Saturday, could take the 7.30 to Eastbourne on Sunday morning, spend a quiet day there, returning to town at night, and so be ready to proceed to Dublin on the 21st.

Everything was ready, that is to say, the triple, etc., had gone on as a sort of agent in advance; dress suit carefully folded into my valise, a special policeman bribed to the tune of a bob to pull the right hand bell at "Phil's Chambers," Great James Street, just before he went off duty at six; a drum alarm clock, that always went off with a terrible bang and often fell on to the floor as well, was fully wound and set, also for six; with what a satisfied air did I turn in; how soon too peaceful sleep led me into dreamland, where there was my Lord this introducing me to His Grace the other; how the Lady Helen B. praised the lanternist to the Viscountess C.; how the county families seemed to enjoy Lord Vincent's pictures; with what a relish, too, did the——, but stay, I am wide awake staring at the drum, whose dial read—Heavens! What?—two minutes to seven. With an adjective on my lips, that began with a D. I leapt from the bed with an ejaculation, "I'll go for it," and did; but what madness. Partly dressed, valise in hand, I trundled towards Holborn, calling all the way for cab, cab, but there was no cab, the streets were as quiet as a cemetery, and as peaceful, for it was Sunday morning. Nearing Ludgate there was, however, one in sight. "London Bridge—quick—seven-thirty—Hastings line." "I can't do it, sir, I really can't, its twenty-five past now." "You must—try," I shouted. He did try; the poor devil of a horse went over Blackfriars Bridge as he'd never done before. Southwark Street was roused as though the fire brigade had turned out, and turning up the incline to the station my coachman ran foul of a basket of watercress and nearly had a spill; a moment later I was at the booking window, only to see it close in my face; rushed to the platform: "Porter, Eastbourne train." "There it goes, sir," and true enough the tail, or rear of the "parly" was fading in the distance. I knew of no other till evening, but like the drowning man clutched at the straw. "Porter, time of next to Eastbourne." "Nothing before the evening, six o'clock." My eye wandered across the station at that moment, which by this time was empty, and noticed an old porter on the further platform sweeping; years before his face was familiar, and as quick as possible I was in conversation with him.

"Look here, friend, I've missed the Eastbourne train, and its imperative for me to get there to-day." He hesitated, laid his broom aside. "Follow me, sir, there's a chance I think open to you." He led me into an office, scanned the tables, "Yes, sir," he said, "if the 9 o'clock Brighton special keeps her time, and she's seldom a minute out, you'll catch the eleven Hastings express, which pulls up at Polegate Junction, where the Eastbourne passengers change. The special's due in Brighton at 10.50, so it's a risky bit."

I could have hugged that man who had given me fresh hope.

"So I've an hour and a quarter to spare," I said. "About that, sir," he said. "By the way, sir, excuse me, but ain't you the gent that nearly caused the death of our old guard over that lantern gas job." "Ah," I muttered, "but I'll see you five to nine sharp."

The hour and a quarter was easily filled up. Telegram to Lord Vincent, "Don't send coachman to station, am coming on from Brighton."

Then I adjourned to the hotel on the rise; had a bath and breakfast, and by the time I was seated in the special felt fresh and fit. All went well till we neared Red Hill, when we eased up for signals. I took out my watch to mark the wait, and horror! six, seven, eight minutes before we moved. "Shall miss it," I said to a fellow traveller, and true enough I did, for as we went into the Brighton terminus the eleven o'clock passed on its way out. 'Twas evident the fates were against me, but as the old folks say where there's a will there's a way, and so upon enquiry I was informed there was a 2.50 express to Eastbourne and Hastings. I was mulct into paying a double fee for a second telegram, because it was after hours, which by-the-bye was not delivered until two hours after my arrival; my valise, too, was nearly left behind in consequence of having deposited it in the cloak room at B. which I discovered on my return was closed till the evening; but it was redeemed after a struggle.

It was not until I heard the lime jets hissing a familiar jangle, in Lord Vincent's house that comfort was restored to the inner man. I prefaced the few remarks I was allowed to make with the above incidents, causing much amusement; but, after all, it's only what happens to many another lanternist. Expensive, true, but it furnishes subject matter wherewith to commence a lecture and put an audience in a good frame of mind.

——:o:——

Carriers and Slide Boxes.

By G. R. Bryce.

THE perfect carrier—if anything can be perfect—has yet to be invented. Its characteristics are, smooth and silent working, quick action, simplicity, no liability to shake the lantern, the easy insertion and withdrawal of slides from same side of the lantern. The so-called "dissolving" carriers have all the disadvantage, more or less, of shaking the lantern, or making unnecessary noise when changing the slide. "Dissolving," as applied to these carriers is a misnomer, for by no means can dissolving be effected with a single lantern; the slides are simply interposed for a moment when one is withdrawn to the side. I think "intermixing" or "confusing" would be a more suitable name for the carriers. Nothing looks better than to see one picture dissolving into the other, or an instantaneous change taking place, but when one sees two solid views on the screen, without the sign of either becoming fainter, and then the disappearance to the side of one of them followed by the unsightly projection of the black mask; or, on the other hand, sees a confusion on the screen for a moment, accompanied, very often, by confusion in the lantern, in the way of shaking, unnecessary noise, or sticking of the slides, we feel that this dissolving is a farce.

There is no doubt that no carrier equals the "lightning" one; with this instrument, the view can be changed very quickly, although not quite so expeditiously as one would suppose from the name—it is practically noiseless and is simplicity itself. It is a decided advantage to have the corner cut off. This carrier possesses the drawback that it is not easily manipulated from one side of lantern. The form of carrier in which an opaque curtain falls to obscure the view, and rises to reveal the new one is very neat, the momentary darkness on the screen relieving one's eyes. The "push-through" variety is the simplest of all, but the effect on the screen is by no means pleasing. The little streak of white light which gets between the edges of the slides in the lantern is, of course, magnified on the screen, and forms anything but an artistic method of changing the views. Moreover, one slide—more especially if both in the carrier happen to be thin—is apt to get in front of its neighbour when being pushed through unless the instrument is fitted with springs to obviate the nuisance.

The form of box which I like best for storing slides is that one with the moveable spring partition. This box will hold from ten to sixty slides with perfect safety. The advantage of the spring partition is that the slides are held firmly together, which, besides being safer, makes them more portable than if placed in grooves.

The grooved box is the worst kind for keeping slides in. The grooves are apt to tear the binding of the slides, and if made, as generally, of wood, are liable to warp or become loose. Moreover, in comparison with the size of the box the number of slides contained is very small; thus, the length of a fifty-groove box which I possess is (outside) 15 inches, while that of a spring partition one only 11 inches, which, although not nearly full, contains sixty slides. Fifty slides of average thickness measure about 6¼ to 6½ inches, so the space wasted in the grooved box is very great. I have seen grooved boxes much longer than the above to contain the same number of slides, but their clumsiness was painful.

Another good box is that one with rubber tubing on lid and bottom; this holds any number of slides up to ninety or a hundred, according to size, with equal safety to the form already described. With this box, the slide has simply to be placed in position and the lid closed, without the trouble of moving any partition, etc. To the time economist this will, therefore, doubtless lend itself.

The one advantage which the grooved box holds over others is, any slide may be taken from the middle of the set and replaced without danger of inserting it in its wrong position.

A point to which makers should turn attention is the provision of a handle on slide boxes. Some boxes it is true have a strap to buckle on top, but this is not a good method in my opinion. Why should boxes not have lids sliding in grooves, and be furnished with neat brass handles? It would not be safe to fix a handle to the lid of the present usual slide box, as the hooks and hinges which connect the lid to the under-part might give way under the strain, which would, of course, be very great, being caused by the weight of such heavy articles as lantern slides.

Lighting Tableau Vivants and Stage Effects.

By C. D. Bishop.

NOW that living pictures have caught on, the lanternist is often called upon to light up these groups of figures, and it is often thought by those who have not had an opportunity of otherwise judging, that the ordinary lantern will answer for this purpose. So it will, with a little alteration, in an emergency. We will come to this later.

The correct and best method is to use a proper light box. This is usually a square blacked box lined with iron opened front and back, the front carriers, the lens, a plano-convex of long or short focus (as is most convenient). The back allows the access of lime-tray which carries the jet.

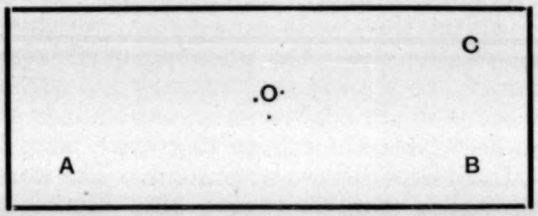
In the front of the lens are projecting pieces top and bottom, in which are cut a groove or rebate for sliding in coloured glasses. To the bottom and sides of box are fitted some means whereby the rectangular motions are obtained, which may be as simple as possible, or as elaborate as the pocket allows. In many instances the motions may be dispensed with. As the amateur's light box may be used for various purposes, it had best be fitted with a side swing motion at least.

As to the lens, focus, and size best to use, a 6 inch is the size most in use; if a larger lens is used a larger area is covered, together with an increase in light in consequence. With regard to focus of lens, for small confined areas where a large space is to be covered, a long-focus lens is best; for covering a smaller area at a fair distance, as in the London theatres, where there is plenty of room, a short-focus lens is preferable. In short confined spaces, or when close on to the subjects, a long-focus lens is best; it has also the great advantage of giving a flat disc—not the prismatic edge that is so often seen thrown with a light box.

Having settled as to the apparatus that we have to use, we now will take a tableau and see how to do it.

We have a scene of a property made tree and three figures standing beneath it, and call it "April showers." The scene beyond is a green pastural view, which would be known technically as a back cloth.

The figures should be lighted with a light box each side (A) and (B). If the light spreads too much, draw the tray with jet attached backwards in the box; this produces the smaller disc. At (C) an open jet is burnt with a large sheet of pale blue glass or gelatine in front, or perhaps the colour medium is best dispensed with, according to circumstances. The object of keeping an open jet burning at the back of the figures and near the back cloth, is to kill the shadows that are thrown by the light boxes in front, and to give distance to the scene. The evil to be avoided in all tableau lighting is the shadows, or the prismatic tints from the edge of a light box lens. Tinting effects can only be shown to advantage when a number of boxes are in use, and complete immutability from white light either from the footlights or in the flies. Unless complete darkness can be obtained it is useless to attempt any colour effects. It must also be remembered that when a coloured medium is put in front of the lens there is at once a great loss of light, and this must be compensated for by the addition of extra boxes or lights. Only figures wearing white clothes will show the effect of colour. If the figures have dresses of dark tints, or heavy contrasts, colour tinting should not be attempted.



In lighting up a group always remember that the figures in front should have the most light—side-lights thrown slightly at an angle are the most successful.

Skirt Dancing.—The dancer should be lighted from both sides of the stage, and the figure carefully followed. One box or lights from one side will not do for this, as the figure sometimes gets so close under the lighted side of the stage that the rays have not dispersed sufficiently to cover the whole figure. The lighting of a skirt dancer is best done with white light only, unless the figure is in white, when pale tints of soft green, heliotrope, and amber can be used. The background ought to be as dark as possible, with no open lights about of any kind.

Serpentine Dancing.—Certainly the prettiest and novelest effects of all lighting can be done in this case. Liberty in every direction is allowed for the display of effects of colour, and the aid of the lantern brought in.

The background for this should be perfectly black, failing that some dark material or velvet curtains. If it can be managed all lights attached to the stage turned down, footlights included. Deep colours, as reds, blues, and greens, may be used with startling effects. Those working the light boxes should carefully watch the cue for changing the colours, and be together; if two tints of relative colour value are on at once instead of colour, white light will result. A large circular disc fitted with different colour gelatines revolved in front of the lens gives the rainbow hues, ever changing and never still.

As the dress worn by the dancer is generally white, and very voluminous, a lantern picture may well be thrown on the figure when it is still; pictures with a good contrast, such as portraits or similar slides are best, and most suitable. A most charming illusion is by working chromatropes on the drapery in the same way. Of course, it is necessary to have the lanterns more in the front of the figure than is needful when the light box only is used.

It is hardly necessary to state that this class of lighting and illusion should not be attempted without proper rehearsal beforehand. The average manager of amateur performances often has little idea of the skill and expense attached to doing the thing properly. He hires a man with a single box, which he sticks anywhere behind, and thinks he is going to produce marvels; much disappointment and often disgust is brought about in this way. If carried out thoroughly and well, it enhances the effect of the entertainment far beyond the average person's conception.

Lighting Figures with the Lantern.—When it is necessary to light up a figure or figures temporarily, and only the ordinary lantern is at hand, place the lantern in front of the stage, and take out the front tube with lens attached; also unscrew off the back half of condenser, so that the front half of the condenser is the only optical portion of the lantern left. A small disc only will be covered, which does not allow of much variation.

——:o:——

Kinetoscope and Lantern.

By A. Lomax.

THE introduction of the Edison kinetoscope has undoubtedly caused special attention to be given to instruments of this class, and which are known under many and diverse names. The general principle upon which they are all constructed is practically the same, and is very, very old —as age is taken in these rapid times, but the manner or mode of construction varies to a considerable extent. No doubt some readers will remember the account (as old as 1839) published in the volume "Philosophy in Sport made Science in Earnest" of the thaumatrope and Mr. Seymour's improvement of the same; also of accounts of older productions of similar kinds of apparatus. Many names have been given to them, such as phantasmascope, M. Plateau's phenakisticope or magic disc, and a name still better known, zootrope, or wheel of life. A decided advance is to be found in M. Raynaud's praxinoscope—a further and clever improvement—described many years ago by the editor of "La Nature"; in fact we have in this somewhat early apparatus the introduction of the word theatre in this connection, the instrument being widely known as the praxinoscope theatre. Passing on, we have the work of Muybridge, Marie, and others. Muybridge may be regarded as an eminent foundation worker in the cause of recording and reproducing the so-called "movements as of life." Years ago I had the pleasure of assisting him at one of his illustrated lectures, and was astonished at what he was able to illustrate of movement, both simple and complex, by projecting the images on to a large screen. An interesting account of some of Muybridge's work also appeared in one of the "Century Magazines" during the year 1882. In 1887 Edison began to seriously take the work up—indeed year by year scientific interest was slowly but surely growing to the wonderful possibilities of what could be done by directing more attention to the matter. Muybridge, however, first brought the special aid of photography as the ideal means by which to obtain results of a practical kind. In 1889-90 Mr. Greene patented apparatus for recording and reproducing motion. There is also the machine of Anschultz's. This was known as the electric wonder, and was a beautifully constructed apparatus of the automatic class. Having for a period had charge of a number of these machines I well know their structure, and (next to Edison's kinetoscope) I feel convinced that the electric wonder is the most perfect mechanism ever produced in machines for illustrating motion. The climax, however, of all previous results is certainly to be found in the Edison kinetoscope, and, just now, the Edison vitoscope—also known as the Edison theatre.

But, the centre of present interest (especially to lovers of the lantern) arises from the fact that for the first time it is now found possible to depict on the sheet the amazing quick results that are to be seen in the ordinary kinetoscope. As there is much confusion in many minds as to the meaning of names given to apparatus of this kind, I will here digress a moment. The kinetograph takes the pictures; the kinetoscope reproduces them; the phono-kinetograph (here introducing the phonograph) takes the pictures and records the sounds; the phono-kineoscope reproduces the sounds, and, on a screen, the pictures; the kineto-phonograph in a comprehensive term for the whole invention; the kinetophone refers to the reproduction of the sounds and pictures seen and heard through the kinetoscope only, and not projected on a screen; the term Edison theatre refers to the phono-kinetoscope. The cinematographe (also spelled with a 'k') and theatregraph (also known as the animatograph) refers to machines for projecting kinetoscope pictures on the screen. The vitoscope (the Edison machine) is the same as the phono-kinetoscope but without the phonograph. Muybridge also gave a name to his special mechanism for projecting animated subjects on the screen. Names are now increasing *ad libitum*—vitograph, motograph, panoramograph, kineoptican, all these refer to machines covered by the term Edison vitoscope. The cart is often put before the horse, but, terms ending with "graph" ought to refer to machines for taking the pictures, and terms ending with "scope" to machines for reproducing them. No practical purpose is to be gained by enlarging on the merits or demerits of any machines of the above types of an earlier date than the Edison kinetoscope. The kinetoscope by a single bound placed itself so far ahead of every earlier attempt as to constitute an advance, amounting almost to an entirely new discovery— that which before was theoretical or only half-practical Mr. Edison made into a realization. To contrast the past (even of a few years back) with the present is inapplicable. Apparatus that would take or reproduce pictures at the rate only of a comparative few per second would certainly not illustrate the scenes and motions possible to-day. The eye would be offended because the motion (except for simple movements) would be unnatural by reason of its being too slow—complete scenes, rapid and complex motion, has been rendered only possible by means of the Edison apparatus. Even Muybridge's results in many cases (flight of birds for instance) were too slow. It is mainly for the above reason that the earlier apparatus was only half-practical.

The difficulties in constructing a really reliable kinetoscope projector for the lantern are very great—to many people insurmountable. In fact, many of the machines now before the public (owing to construction on wrong principles) are most unsatisfactory in action. Many of the machines are simply copies of each other, and scarcely any display originality either in design or structure. The chief difficulty is in the obtaining of steadiness, absence of flicker, and a reliable check to over-running of the film. Many would-be makers think that if each picture can be stopped in its course success is attained. This is not so—to use a figure of speech, if you could fire a gun in such a way that there shall be no recoil from the shock, then you would succeed in making a perfect kinetoscope projector. In this extreme (but for my purpose of illustration) true paradox, lies the kernel of the whole matter. This (the effect of the recoil) is a great—the chief—difficulty to be overcome. It is because of this obstacle to success that nearly all the machines at present before the public produce in their results such bad vibration of the picture, and the quicker they work (so as to get natural movement) the worse is the vibration. In proportion therefore as the shock and recoil of the picture is overcome, so will be the vibration. In order to determine the factors to deal with, a little closer examination of the essential mechanism and the nature of the work it has to do, will be necessary—especially bearing in mind the principles upon which its operation depends. An ordinary sewing machine will admirably show an object lesson in what is to be expected of the principle movement of the projector.

Everyone will be familiar with the pressure foot under which the cloth to be sewn is placed, and the roughened plate of metal under the same, the object of which is to carry the cloth forward. If it be imagined that this is a part of the projector, the light must penetrate the film in exactly the same relative way and period as the needle penetrates the cloth. In this connection the following details of the ordinary Kinetoscope, in which the film is never brought to rest, will also be useful. The pictures move at an average speed of 30 per second (though this is sometimes very much increased), and one revolution of the shutter moves the film by the distance of one picture. The slit in shutter is one-tenth, and the mean diameter 10 inches. The picture itself is only visible to the eye about the 310th part of the time it takes to move from picture to picture, and each part of the picture is only visible to the eye about the 9,300th part of a second, the whole picture being visible about the 1240th of a second. Indeed, in reference to speed details of picture an impetus of even 60 per second could by one mode of reasoning be ascertained. The pictures are taken on a continuous band of celluloid film, and their size is 1 by ¾ inches. They are taken on the Kinetograph at a speed of at least 20 per second. With projection apparatus the change from picture to picture is effected at a required rate of 4 miles per hour and in a 0 by 3¼ inches space —an enormous rate when it is remembered that each picture must be brought to a dead stop, this being vitally necessary in order to obtain light enough for projection purposes. It is for this reason that the mechanism of the ordinary Kinetoscope cannot (as many seem to imagine) be adapted for purposes of projection, the movement of the film in this case being continuous without break or stop. The great speed, the sudden stops and jerks of the film, the need of pressure pads or other apparatus for regulating the slack or over-running of the film; all these lead to the crux of the difficulties in constructing such apparatus—in addition to which the flicker of the light has also to be reckoned with. In the operation of the projector mechanism it is required that the film be drawn automatically into correct register, the light admitted and picture projected on the screen for a small fraction of a second, after which the light is turned off, and another picture dragged into position. The pluck of the film is more or less overcome in various ways, but no method is reliable that causes the least unsteadiness or vibration during the period the picture is on the screen—it is a mechanical result and cannot be overcome by optical methods alone. In conclusion let it be noted that there need be no surprise manifested because of the fact that there are so very few reliable machines in the market—that is, that can be thoroughly depended upon to give true results. The necessary factors are, practically, a perfectly steady picture, good light and definition, and absence of flicker—whoever constructs a projector up to such a standard, will effect a work of which he can, with all justice, be proud. Ordinary kinetoscopes cannot be altered and adapted for projection purposes—the question has often been asked.

——:o:——

The Invention and Development of the Optical Lantern.

By Edward Dunmore.

CHAPTER III.

THE condenser is next in importance to the projecting lens, as without a good condenser, free from scratches and striæ, it is impossible to get a good picture with the best lens made. The condensing lens is, as its name suggests, used to condense the light upon the slide, gathering together every available particle that would otherwise be wasted on the inside of the lantern and pass it through the transparency, thoroughly and equally illuminating it. Without the condenser only the central portion of the picture would be seen, the edges being buried in obscurity. Much attention has of late years been given to this lens, which has developed from a plano-convex block of indifferently good glass to a system of lenses, achromatic and rectilinear. The first improvement was the use of two plano-convex lens placed with their convex surfaces opposite each other. This was a great improvement on the single lens; still, much light was wasted. The next improvement was the addition of a third smaller lens of the same form placed next the light, which vastly increased the illuminating power. The periscopic, in combination with a double convex, used with the concave side towards the light, was another form. In Taylor's "Optics of Photography" the best form of condenser is stated to be a plano-convex and a crossed lens, the former being nearest the light, but will not include so wide an angle as those of the triple form. The wider the angle included the greater the light; on this account, several lenses are used instead of one. Again, to quote from Taylor's "Optics": "In the collecting system we must have at least two lenses for our purpose. One of them, that nearest the light, must be 4½ inches in diameter in order to catch up 95 degrees, but this cannot render the rays parallel; still it transmits them to its colleague under such circumstances that it does so, the two lenses doing what no one singly could effect."

The first lens of the collecting system is comparatively thin, which, apart from any optical advantage, is useful in this respect, that it has to bear the first impact of heat, and thus lessens liability to fracture. It is only 16 m m. (⅝ inch) thick in the centre, is 8 to 9 inches focus, and is formed by preference of flint glass. The second element is 5 inches in diameter, and the radii of curvatures being rather shorter, also combined with its greater diameter, causes it to be proportionately thicker, being 28 m m. ($1\frac{1}{16}$ inch) at the centre, and 7 inches focus. The lens, too, should be made of colourless glass. The loss of light from absorption is trivial, and that from oblique incidence is really so little as to be unworthy of notice, but it carries with it its compensation, for it occurs most at the thinnest portion of the lens where there is least absorption, and thus aids in ensuring uniformity of illumination throughout the entire beam. But it may be reduced by rendering the first surface concave instead of plane, and retaining the balance of power by grinding the back surface on a tool of shorter radius. The two lenses described should be mounted together as close as possible, fixed permanently in the lantern, and must always be used together and not separate. The condensing element of this optical system, on the other hand, must be variable and selected to suit the special end in view. Its form may be plano-convex, especially if for use with long focus objectives; but if the latter is to be short focus, and the condenser of crown glass, then is the crossed form in which the curves are as one to six, or two to thirteen, to be preferred. But dealing as we now are with immergent parallel rays it would be folly to imagine that a condenser properly adapted for an objective of 12 inch focus will answer equally well for one of 6 inches. Bearing in mind Kepler's law, which, however, applies only to one kind of glass, and must not be held applicable equally to the flint glasses, especially those of the denser sort procurable at the present day. We would say that for long projection lenses of 12 to 15 inch focus, a plano-convex having a radius of curvature of 7 inches will serve every purpose, for an objective of 8 to 10 inches the radius may be 4½ inches, while for one of 6 to 8 inches, 4 inches will suffice.

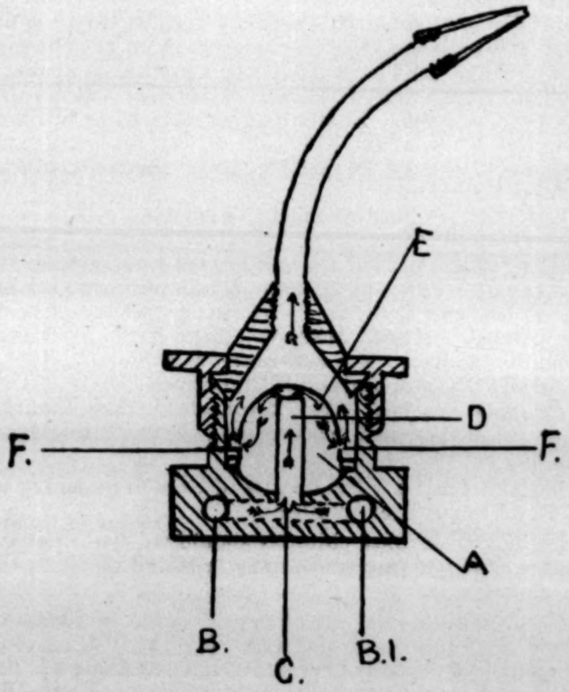
(*To be continued.*)

—:o:—

New Apparatus.

LOCKE'S NEW PATENT JET.

This invention consists of a mixing chamber (A), to which the gases are conducted by the two usual tubes (B) and (B 1), but instead of leading the gases direct into the chamber, they are caused to intermix underneath it at (C), and to enter the chamber together through the vertical tube (D). The gases are prevented from rushing direct to the nipple by a deflecting cone (E) placed over the vertical tube which causes the gases to descend, and to issue into the upper part of the mixing chamber, as indicated by the arrows, through a number of small perforations marked (F) and (F 1) around the base of the cone. The gases pass thence to the nozzle or burner by a tube of special length and bore. The nipple is a true cone in section, as also the upper part of mixing chamber. The jet is the result of close observation and experiment on the part of Mr. Locke, of 244, Tottenham Court Road, London, during many years practical work as a lanternist, and is of immense power; the gases burn with the greatest possible steadiness, and with that quiet pleasant hum which characterises all good jets. The light is intense and highly concentrated, which is a necessity in jets that are for use in optical lanterns. This is accomplished by using a medium bore of $\frac{1}{16}$ inch; larger bores may be used with increase of light, but the gain optically is not worth the extra gas consumed, to say nothing of the unnecessary heat. It may be interesting to mention that when recently experimenting with the jet, it was found that an excellent light could be obtained by drawing the hydrogen from the usual house service instead of from a high-pressure cylinder, the difference in loss of light not being more than about 20 per cent.; but the use of low-pressure hydrogen with ordinary mixed jets is not advised. With the one under consideration it is entirely different, owing probably to the fact of the high-pressure oxygen pulling the low-pressure hydrogen with it through the vertical tube to chamber.



—:o:—

Editorial Table.

THE 27TH ANNUAL SUPPLEMENTAL CATALOGUE OF MESSRS. YORK & SON has just been issued. In it we find particulars of a set of 60 slides pertaining to Johannesburg, a subject which should be very popular at exhibitions this season; also sets on Tasmania, X Rays, Pottery making, Convict ship "Success," from Thames to Tweed, and several humorous sets. Respecting the slides themselves, these are only of one quality—the best.

BEGINNER'S GUIDE TO PHOTOGRAPHY.—The 6th edition of this useful handbook (6d.) has been issued by Messrs. Perkin, Son & Rayment, of 99, Hatton Garden, E.C. It is just the book that a beginner in photography should be very glad to get hold of, as it contains much that is of value, in a condensed form.

—:o:—

Correspondence.

HARPER BROS. & GEN. LEW. WALLACE *v.* RILEY BROTHERS.

To the Editor.

DEAR SIR,—Referring to your notice in the June number, drawing attention to the action taken against our firm in New York by Harper Bros., for an alleged infringement of their dramatic copyright in the "Story of Ben Hur," many readers of your journal have written asking for information about this action, hence we deem it the best way of answering all, to let you know how the matter stands at present. Harpers, in their plaint, allege that a magic lantern exhibition is a dramatic representation, that the person demonstrating or lecturing and the operator at the lantern are the *dramatis personnæ* as much as the "living actors on the stage," and that, therefore, every exhibition of our pictures in conjunction with the lecture is an infringement of a drama on "Ben Hur," which we heard of for the first time when these proceedings were taken, but which they secured copyright upon some two or three years since. After many delays, the action has been heard since Mr. Riley, senior's return from New York. It was argued before Judge Coombs at great length. Our counsel, Mr. Wilber, offered to abide by the definition given of a drama by any author of any dictionary in the English language, dwelling upon the latest and best that has ever been published, in which it is distinctly stated that "a drama is a representation made by living actors, etc., and must have living voices and movements, etc." We understand that the judge, who, of course, said little, remarked to the plaintiffs' counsel that if we had been setting it forth in the "Vitascope," where there is such a real representation of life, he could have understood his argument, but it was difficult to imagine such being brought into a mere demonstration as in a lantern exhibition.

As the point raised was entirely new, and no decision had ever been given upon the point, the Judge stated he would take time to consider it in all its bearings, and announce to the Counsel concerned when he was prepared to give his decision. Mr. Herbert J. Riley writes us that it is not expected now that any reply will be given before October next, so we shall have to wait. In the meantime, they write very hopefully of the result.

Yours truly,
RILEY BROTHERS.

WRENCHES.

To the Editor.

Dear Sir,—I have noticed for a very considerable time a most irritating kind of an advertisement of an extensive order appearing in your journal. In last month it comes forth in an enlarged form.

I have gone through eight or nine of them, page after page, to endeavour to discover the address or any addresses where the articles thus advertised are kept. It does not say in any part of it the names of the agents who supply the things mentioned. The obtrusive trade mark adorning every page is that evidently of wrenches, but then, of course, it is not Wrench's catalogue, and if it were they would surely say so. Is it an omission on the vendor's part, or on design that it is done?

Yours truly,
2nd July, 1896. T. H. HOLDING.

[The inset in question pertains to the goods supplied wholesale (only) by Messrs. J. Wrench & Son of 50, Gray's Inn Road, W.C. Read the foot-note on front page of one of the insets, and you will see that the goods may be obtained from any dealer.—Ed.]

OIL LAMPS.

To the Editor.

Dear Sir,—Your correspondent on oil lamps in June issue, states that in his article on page 70 in the April issue he does not refer to lamps of the edge-wick class at all. The following is an extract from his article:—"At present, users of oil-lit lanterns have to put up with the inconvenience of being confined to the use of short focus objectives, and of being unable to tilt the lantern to an angle of more than 4 or 5 degrees."

The object of my letter (which appeared on page 89) was to prove that this portion of his article was incorrect.

If the writer carefully reads my letter again, he will find no mention of a long focus condenser. Surely your correspondent (whoever he may be) cannot have considered my letter a personal attack! I shall be glad to receive practical suggestions for improving oil lamps, if any of your readers are kind enough to give them.

Yours truly,
Rye, 24th June, 1896. W. STOCKS.

[This came too late for our last issue.—Ed.]

Notes and Queries.

A. B. J. writes:—Please give me your opinion as to whether you consider that acetylene gas will become universal for lantern work. *Ans.*—No, although it will not compete with the limelight, it is vastly superior to oil.

Jalonisyi asks: What focus of projecting lens will be required to produce a disc (with a mixed jet) 20 feet in diameter, as I can only stand the lantern about 40 feet from the screen. *Ans.*—Use a lens of 6 inch focus. You mention a mixed jet; this has nothing to do with the distance.

Quality asks:—If Watson's Van-Neck hand camera is a good one. *Ans.*—Yes, you will find a description of it in one of our back numbers.

Jas. Morse.—(1) The chloride prints are insufficiently printed; they should be printed pretty dark as they lose in toning. Some dealers suggest that P.O.P. paper should only be printed a little darker than required for the finished print, but experience teaches that they require to be printed a good deal deeper. (2) The negative is well exposed, and your subject well chosen, although we would not like to say it would gain a medal at competition.

W. Wallace Junr.—(1) Certainly not, for no amount of soap will keep the gas in if the connection at cylinder is not perfect. (2) The automatic gas producing apparatus is being proceeded with, and we consider just the thing for your purpose. From an advertisement in this issue, you will see that Mr. F. Brown of 13, Ossulston Street, now has it in hand for Mr Stedman. Better communicate with the former.

D. B. S.—We have no means of knowing.

Shutter.—Of the three you mention, Thornton Pickard's focal plane shutter should best answer your purpose.

No name.—This is now the third time that you have sent us the letter for insertion. We must refuse to insert it for several reasons, amongst others, you give neither name nor address; it is written in a scurrilous style, is decidedly libelous, and would do no good.

R. Daws, Holyoak.—We know of nothing that will renovate the perished rubber piping; better throw it away and buy new.

William Church.—Particulars of French polishing will be found in our back numbers.

W. W. B.—A mica chimney should suit your purpose, seeing that you are continually breaking those made of glass.

H. J. Walker.—(1) Of zinc. (2) Some of brass, and others of compo piping and iron. (3) The "dangerous' compound you speak of is correct, but the deposit is very slight, and would require to accumulate for a long time to do any harm. The pipes should occasionally be cleaned out. Brass or copper is certainly not the best of those mentioned.

The Newbury Guildhall Club, the chief social and recreative institution for young men in the town of Newbury, has lately decided to carry out a novel and original scheme of a photographic portrait gallery. The idea is that each member should present a cabinet photograph of himself, and the same should be placed in a continuous line of oak framework, which will be glazed and fixed in the lecture room of the club. It is hoped that many old members will send their portraits, and as all the photographs will be autograph portraits, it is anticipated that in time the club will possess an unique gallery numbering several hundreds of portraits